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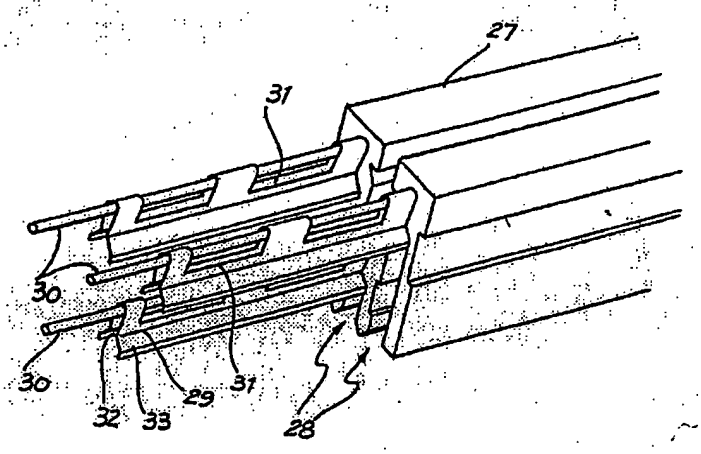

(57) Abstract

A flexible conductive track (1), comprises a flexible insulative plastics housing (2) of constant cross section. This housing is substantially rectangular in shape with three recesses (3) open to one side of the housing. A conductor (4) in the form of a copper wire is held in the bottom of each recess. Affixed to the wire (4) along the whole length of the wire is a conductive blade (5) which is conductively bonded to the wire (4) to form a double spring blade contact (5). A recess (16) is located on the other side of the housing (2). When the track (1) is bent laterally the recess (16 and 3) collapse to assist in the bending.

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FLEXIBLE CONDUCTIVE TRACK

The present invention relates to a flexible conductive track for electrical or communication or other signals' connection and, more particularly, for such tracks for installation around a room or office and accessible for connection at almost any position along its length for take off of electrical, communication, or other signals.

Prior art flexible electric conduit tracks are known. However, they all suffer from disadvantages which have prevented them from being commercially viable.

Such a prior art is US Patent 2,062,752 - Kindberg which has wires forming the power lines embedded in two slits in a rubber housing. This results in only a small area of contact - nominally a "point contact" - between the tines of a power take off device and the conductors of the track with resultant problems with connection failure. Further the configuration of the housing does not readily allow for bending of the track in a lateral direction with respect to the slots. It being necessary to cut one or more notches to facilitate the bending of the track around a corner.

US Patent 2,105,833 - Feuer, et al shows a track which comprises a flexible moulding having two slits with a wire embedded in each slit. Again only a "point contact" with a tine of a power take off device would occur. Further the moulding does not appear to be able to bend laterally to the slits.

US Patent 2, 175,245 - Brockman whilst showing a flexible track, requires that the contacts are in the form of separate jaws, and also only shows a shape of housing which does not permit bending of the track laterally, but only allows bending with the ingress to the contacts being internal or external to the bend direction.

In US Patent 2,240,180 - Frank this describes a flexible track. But does not show a track which can bend laterally. Further the contacts have individual jaws to assist bending with the ingress to the contacts being internal or external to the bend direction.

In International Patent Application No. PCT/SE86/00579

there is described a flexible conductor strip having an elongated wire conductor surrounded by a thin insulation layer with an elongated slot extending through the insulation layer to provide access to the conductor. This conductor strip only provides a small area of contact between the conductor and a take off device. Further, because of the small diameter of the conductor strip, the strip will twist during bending resulting in the slot twisting out of position.

Systems utilizing the above tracks as described in the abovementioned references do not allow a secure connection to the conductors in the track; but rely on a straight "push in" of the tines of the power take off into the slits containing the contacts, generally relying upon the resilience of the material of the house to retain engagement.

A rigid supply rail system having bus bars located in vertically extending elongated channels are known, and described in International Patent Application PCT/AU86/00252. This reference provides a single small diameter elongate conductor located adjacent to the roof of the channels. Access of the channels is by way of an elongated opening located on the side wall adjacent the base of the rail. Thus the connection of the take off device is dependent on the small area of contact between the tine of the take off device and the elongated conductor. Further, when a change of direction is required for the supply rail, a corner adaptor is required to be conected between the adjacent supply rails. Therefore because of the conections between straight rail sections and corner adaptors, an increase in impedence of the supply rail system occurs. Therefore if a high fidelity signal is required, this system could cause interference or noise, distorting the signal.

The use of a rigid supply rail is also shown in US Patents 4,243,284 - Humphreys, 4,462,650 - Humphreys and 4,479,687 - Humphreys et al. These references show a limited access to the conductors by way of discrete doorways with resultant complex arrangements for opening and closing.

The present invention seeks to ameliorate the beforementioned disadvantages by providing a flexible conductive strip able to bend laterally, comprising:

a) a flexible elongated insulative housing of constant cross-section having:
   a first face;
   a second face remote from said first face;
   a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and
   second and third longitudinally extending recesses open to said second face, each being located adjacent a respective edge of said housing and extending inwardly towards said first face;
b) a flexible elongated conductor located in and extending along each of said second and third recesses remote from said second face; and
c) a flexible elongated conductive blade located in, and extending along each of said second and third recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing.

Preferably, the second and third recesses extends towards the first face such that a substantial depth of said first recess is located intermediate said second and third recesses.

In another form the invention comprises a flexible conductive track able to bend laterally comprising:

a) a flexible elongated insulative housing of constant cross-section having;
   a first face;
   a second face remote from said first face;

a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and

second, third and fourth longitudinally extending recesses open to said second face,

said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween,

said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses;

b) a flexible elongated conductor located in and extending along each of said second third and fourth recesses remote from said second face; and

c) a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing.

In another form the present invention provides a system, for providing electricity, communications or other signals, comprising:

a) a substantially rigid elongated housing of constant cross-section, wherein in cross-section, said housing comprises:

a first chamber;

a second chamber;

a first opening allowing access between said first chamber and said second chamber; and a second opening to said second chamber, located in a plane substantially normal to the plane of the first elongated opening;

b) a flexible conductive track comprising:
a flexible elongated insulative housing of constant cross-section having;
a first face;
a second face remote from said first face;
a first longitudinal extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and
second, third and fourth longitudinally extending recesses open to said second face, said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween;
said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses.

c) a flexible elongated conductor located in and extending along each of said second third and fourth recesses remote from said second face; and
a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing, said flexible conductive track being held in said first chamber with said second face of said track facing said second opening of said rigid elongated housing;

d) a take off means comprising a projection, and tines extending radially from said projection and conductively connected to an external output from said take off means, whereby said tines are adapted to engage in a conductive manner with a respective blade means in a

respective recess of said flexible conductive track, when said projection is inserted into said second opening of said rigid housing with said tine aligned substantially with said second opening, and said power take off device being then rotated to enter the first opening to engage the tines with said blade means.

Preferably the track is positioned with said first opening facing substantially downwardly, with said track extending in a horizontal direction. This construction prevents the ingress of dust and other pollutants onto the conductors and protects the conductors from splashing or the accidental ingress of water.

The invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 illustrates an end view of a flexible conductive track according to one embodiment of the present invention;

FIG. 2 shows an end view of a further embodiment of a flexible conductive track according to the present invention.

FIG. 3 illustrates an end view of one embodiment of a support housing to support the conductive track of Figure 1 or 2;

FIG. 4 illustrates a base adapted to be fitted to the housing of Figure 3;

FIG. 5 illustrates a connection member of a take off device according to one embodiment of the present invention; and

FIG. 5A illustrates a further form of a connection member according to another embodiment of the present invention.

FIG. 6 illustrates a take off device according to one embodiment of the present invention;

FIG. 7 illustrates one embodiment of the supply system according to the present invention (with the corner adaptor removed) and cutaway on the flexible track.

FIG. 8 shows a plan view of the system illustrated in Figure 7 to show the resultant configuration of one embodiment of the flexible track of the present invention

during bending of the track;

FIG. 9 shows the section view taken in the direction of arrows 9-9 in Figure 8;

FIG. 10 shows a section view taken in the direction of arrows 10-10 in Figure 8;

FIG. 11 illustrates another embodiment of the flexible track of the present invention;

FIG. 12 illustrates another embodiment of the tracking system according to the present invention;

FIG. 13 illustrates a housing according to a further embodiment of the present invention;

FIG. 14 illustrates a distribution system of one embodiment of the present invention utilizing the housing shown in Figure 13;

FIG. 15 illustrates a further embodiment of a housing usable in the present invention;

FIG. 16 illustrates a further embodiment of a housing usable in the present invention;

FIG. 17 illustrates an adaptor plug usable with the distribution systems of the present invention; and

FIG. 18 shows a cutaway view of the adaptor plug illustrated in Figure 16, showing the engagement of the connecting prong forming an electrical contact with an adaptor plug.

As shown in Figure 1 a flexible conductive track (1), according to one embodiment of the present invention, comprises a flexible insulative plastics housing (2) of constant cross-section. This housing is substantially rectangular in shape with three recesses (3) open to one side of the housing.

A conductor (4) in the form of a copper wire is held in the bottom of each recess. Affixed to the wire (4) along the whole length of the wire is a conductive blade (5) which is conductively bonded to the wire (4) to form a double spring blade contact (5). In the flexible conductive track, as shown in Figure 1, the wire (4) is held in the recesses by shoulders (6) located adjacent the bottom of each recess (3).

The blade means can be a single blade with biasing

means formed integrally with the walls of the recess to urge the tines of a take off unit into intimate contact with the blade (5). Further, the wire (4) and conductive blade (5) can be moulded into the housing wall by means of cross-head extrusion, when the housing is extruded.

As shown in Figure 2 a further embodiment of the flexible conductive track of the present invention comprises three recesses (3) with an elongated conductors (17) connected by pressure welding to arm (18) or (19), or both, of a bifurcated contact spring (20), which extends longitudinally along the length of the recesses (3). The contact spring (20) is held in the recess (3) by the free ends (21) of contact spring (20) resiliently bearing on shoulders (22) of the recesses (3) or held in the recess by crosshead extrusion. The contact spring (20) may provide both the spring action and conductivity in the single form.

Both flexible tracks (1), as shown in Figures 1 and 2, have a recess (16) located on the face opposite to the first face. This extends along the length of the track and enhances the flexibility of the track.

A suitable housing (8), as shown in Figure 3, can be affixed to the wall of an area, where the system of the present invention is to be used. A single continuous length of a flexible conductive track (1), as illustrated in Figures 1 or 2, for example, is fitted into the channel (7) of the housing (8). The channel (7) is configured to hold the conductive track (1) such that open ends of the recesses (3) face downwardly.

The base (9) as shown in Figure 4 closes the bottom of the housing (8), leaving an elongated side access opening (10) which extends along the entire length of the housing (8), as shown in Figure 7. Connection to the wires therefore can be made at any position along the length of the conductive track (1).

When the flexible track (1) is laterally bent around a corner as shown in Figures 7, 8, 9 and 10, the recesses (16 and 3) collapse to allow lateral bending.

A take off unit in the form of a power point is shown

in Figure 6. The power point (11) has a projection (12) extending from the back with one or more tines (13) extending radially therefrom. A view of the projection is shown in Figure 5. To connect the power point (11) to the conductive strip (1), the tines (13) are aligned with the opening (10) and the projection (12) inserted into the opening (10) and the power point (11) rotated such that the tines (13) engage the respective blades (5) in the recesses (3). Because of the double blade spring construction, the blades (5) are urged into intimate engagement with each side of the tines (13) such that both flat areas (14), provide a relatively large contact area.

To further inhibit arcing between adjacent tines (13), when connected to the conductors/blades (5) in the flexible conductive track (1), the walls (23) of the housing (8) have their free ends (25) configured to mate with recesses (24) on the projection (12), isolating each tine (13) from the others.

Alternatively as shown in Figure 5A, part of the length of one or more of the tines (13) can be sheathed in plastics, with or without the recesses (24), such that upon insertion of the tine into the recess (3), the plastics sheath (26) extends into the recess (3) to inhibit any arcing or discharging between the tines (13).

The powerpoint (11), as shown in Figure 6, comprises a combined locking means and an on/off switch (15) to secure the powerpoint to the housing (8), wherein when said power point (11) is rotated, after the insertion of the tines (13) into the opening (10), power is only available to the external output (72) upon manual operation of the locking means (15).

In another embodiment the projection 12 may be moulded directly to a power lead.

If required a cover strip could be used to seal the opening (10).

As shown in Figure 3, the housing can comprise two channels one for telecommunication and one for power. However any number of channels could be used, for example one respectively for power, stereo systems, computer lines,

parallel projections, one (47) with a hook (48) located along the free end thereof.

The cassette (46) comprises an elongated recess (49), and a cutout (50) located at one end. The projection (51) is fitted into the recess (49) of the cassette (46) and the hook (48), because of the resilience of the material of the housing (37) snaps into the cutout (50), locking the cassette (46) in position. In the embodiment shown, the cassette (46) has its open mouth (52) facing downwardly. A cover strip (53) can be inserted into the opening (54) below the cassette (46), where it rests on the elongated support (55) and locks into the cassette (46) by means of the projection (56) to close the mouth (52) of the cassette (46).

Fitted into the cassette (46) can be any form of conductive track, (however preferably a flexible conductive track (1) shown in Figures 1 to 11 is used), as shown in Figure 14, with the shoulders (57) of the cassette locking over the outer walls (58) of the flexible conductive track (1), with the barbed projection (59) engaging in the locating recess (16) of the flexible track (27).

A take off means (60) as described previously can be used to connect to the conductors (20), whereby power or the like is supplied external of the recess (42) as shown in Figure 14. To close the recess a cover (61) rests on the top supports (62) and (63) of the housing (37), aligning flush with the flooring as shown in Figure 14. The cover (61) has cutouts (64) located at appropriate positions along the cover (61) to allow for egress of suitable cable. These cutouts could be preformed or cutout when needed, and a cord cover strip (65) fits into the channel (66).

Other embodiments of the present invention are shown in Figure 15 utilising multiple cassette mountings (45).

In Figure 16 the housing 34 as illustrated in Figure 12 can be used in a floor mounted arrangement similar to Figures 14 and 15.

Preferably the housing and cassettes are made from suitable plastics.

gas, optical fibres, etc.

The flexible conductive strip can be of any suitable configuration and have any number of recesses.

To assist in the lateral bending of the flexible track an embodiment as shown in Figure 11 can be used.

In the flexible insulative housing (27) are located three recesses (28) similar to those described previously which each contain a conductive blade (29) as shown in Figure 11. A conductor (30) may be connected to the arcuate end of the connector blades (29). The conductor (30) could be standard copper wiring while the blade (29) could be formed of phosphorous bronze. Alternatively, the conductive blade (29) could be constructed so as to be used on its own, without the necessity of the additional conductor in the form of a copper wire (30).

At preselected positions along the length of the conductive blade (29), cutouts (31) are located along its length. These cutouts (31) do not extend into the contact area (32) of the arms (33) of the conductive blade. These cutouts (31) enhance the flexibility of the conductive blades (29) and hence the flexible conductive tracks (27) into which they are inserted.

Additional as shown in Figure 12, the housing (34) used to contain the flexible insulative track (35) can have external fittings (36) for the affixing of suitable colour strips (not shown).

One embodiment of a floor mounted system according to the present invention is shown in Figure 13 comprises an open face housing (37), with two opposed side walls (38) and (39), and a channel portion (40), which has a base support (41). This embodiment is used to be inserted into a recess (42) in a floor (43) as shown in Figure 14.

Located on the sides and base of the channel portion (40) are cutouts (44) to allow any moisture to drain out of the housing, and along and out of the floor recess (42).

A mounting means (45) is provided to hold an elongated cassette (46) therein. The mounting means (45) comprises two

The cassette in use can also face sideways with a suitable hinged or flapped cover slip covering its mouth to prevent ingress of contaminants.

As is shown in Figures 17 and 18, the electrical connector (67) of the power point adaptor (68) comprises two arms (69) which are made of resilient metal. The prong (70) of an appliance (not shown) slides into engagement between the arms (69) and the screw (71) is tightened to urge the arms (69) into intimate contact with the prong (70). Sufficient pressure can be generated by the screw (71) to provide the equivalent of a fixed contact between the prong (70) and the arms (69).

In a further embodiment not shown, the prong could have a recess or bore into which the screw will engage to rigidly connect the prong to the electrical connectors.

This form of connection is not only limited to distribution systems, as before described, but can also be used with respect to standard power points and double adaptor connections.

THE CLAIMS

1. A flexible conductive strip able to bend laterally, comprising:

a) a flexible elongated insulative housing of constant cross-section having:

a first face;

a second face remote from said first face;

a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and

second and third longitudinally extending recesses open to said second face, each being located adjacent a respective edge of said housing and extending inwardly towards said first face;

b) a flexible elongated conductor located in and extending along each of said second and third recesses remote from said second face; and

c) a flexible elongated conductive blade located in, and extending along each of said second and third recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing.

2. A flexible conductive track able to bend laterally comprising:

a) a flexible elongated insulative housing of constant cross-section having;

a first face;

a second face remote from said first face;

a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and

second, third and fourth longitudinally extending

recesses open to said second face,
said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween, said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses;

b) a flexible elongated conductor located in and extending along each of said second third and fourth recesses remote from said second face; and

c) a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing.

3. A flexible conductive track according to claim 2 wherein said second and fourth recesses extend to only a short distance from said first face.

4. A flexible conductive track according to claim 2 or 3 wherein said blades are of the substantially same length.

5. A flexible conductive track according to any one of the preceeding claims wherein said flexible elongated conductor and said flexible elongated blade are integral.

6. A flexible conductive track according to any one of the preceeding claims wherein said blade comprises two opposed arms.

7. A flexible conductive track according to any one of the preceeding claims wherein said blades have a cutout located at their end remote from said second face, at spaced apart intervals therealong.

8. A flexible conductive track according to any one of the preceeding claims in which the first recess has reenterant shoulders.

9. A system, for providing electricity, communications or other signals, comprising:

a) a substantially rigid elongated housing of constant cross-section, wherein in cross-section, said housing comprises:

a first chamber;

a second chamber;

a first opening allowing access between said first chamber and said second chamber; and a second opening to said second chamber, located in a plane substantially normal to the plane of the first elongated opening;

b) a flexible conductive track comprising:

a flexible elongated insulative housing of constant cross-section having;

a first face;

a second face remote from said first face;

a first longitudinal extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and

second, third and fourth longitudinally extending recesses open to said second face, said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween;

said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses.

c) a flexible elongated conductor located in and extending along each of said second third and fourth recesses remote from said second face; and

a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth

recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing, said flexible conductive track being held in said first chamber with said second face of said track facing said second opening of said rigid elongated housing;

d) a take off means comprising a projection, and tines extending radially from said projection and conductively connected to an external output from said take off means, whereby said tines are adapted to engage in a conductive manner with a respective blade means in a respective recess of said flexible conductive track, when said projection is inserted into said second opening of said rigid housing with said tine aligned substantially with said second opening, and said power take off device being then rotated to enter the first opening to engage the tines with said blade means.

10. A system according to claim 9 having a flexible conductive track according to any one of claims 3 to 8.

11. A system according to claims 9 or 10 wherein said second face of said flexible conductive track faces substantially downwardly.

12. A system according to any one of claims 9 to 11 wherein said conductor in the third recess is the earth.

AMENDED CLAIMS

[received by the International Bureau on 5 January 1993 (05.01.93)
original claims 1,2 and 9 amended; remaining claims unchanged (4 pages)]

1. A flexible conductive strip able to bend laterally, comprising:

a) a flexible elongated insulative housing of constant cross-section having:

a first face;

a second face remote from said first face;

a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and

second and third longitudinally extending recesses open to said second face, each being located adjacent a respective edge of said housing and extending inwardly towards said first face;

b) a flexible elongated conductor located in and extending along each of said second and third recesses remote from said second face; and

c) a flexible elongated conductive blade located in, and extending along each of said second and third recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing;

wherein said recesses are adapted such that, when the strip is laterally bent around a corner, the walls of the recesses, at or near the point of bending, collapse so that the width of the recesses is substantially reduced and the strip is allowed to bend laterally.

2. A flexible conductive track able to bend laterally comprising:

a) a flexible elongated insulative housing of constant cross-section having;

a first face;

a second face remote from said first face;

a first longitudinally extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second

face; and
second, third and fourth longitudinally extending recesses open to said second face,
said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween,
said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses;

b) a flexible elongated conductor located in and extending along each of said second third and fourth recesses remote from said second face; and

c) a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing;

wherein said recesses are adapted such that, when the strip is laterally bent around a corner, the walls of the recesses, at or near the point of bending, collapse so that the width of the recesses is substantially reduced and the strip is allowed to bend laterally.

3. A flexible conductive track according to claim 2 wherein said second and fourth recesses extend to only a short distance from said first face.

4. A flexible conductive track according to claim 2 or 3 wherein said blades are of the substantially same length.

5. A flexible conductive track according to any one of the preceeding claims wherein said flexible elongated conductor and said flexible elongated blade are integral.

6. A flexible conductive track according to any one of the preceeding claims wherein said blade comprises two opposed arms.

7. A flexible conductive track according to any one of the preceeding claims wherein said blades have a cutout located

at their end remote from said second face, at spaced apart intervals therealong.

8. A flexible conductive track according to any one of the preceeding claims in which the first recess has reenterant shoulders.

9. A system, for providing electricity, communications or other signals, comprising:

a) a substantially rigid elongated housing of constant cross-section, wherein in cross-section, said housing comprises:
   a first chamber;
   a second chamber;
   a first opening allowing access between said first chamber and said second chamber; and a second opening to said second chamber, located in a plane substantially normal to the plane of the first elongated opening;

b) a flexible conductive track comprising:
   a flexible elongated insulative housing of constant cross-section having;
   a first face;
   a second face remote from said first face;
   a first longitudinal extending recess open to and located substantially centrally in said first face, and extending inwardly towards said second face; and
   second, third and fourth longitudinally extending recesses open to said second face, said third recess being intermediate said second and fourth recesses and extending inwardly towards said first face and terminating short of said first recess to form a wall therebetween;
   said second and fourth recesses extending towards said first face and terminating beyond said third recess such that a portion of said first recess is located intermediate said second and fourth recesses.

c) a flexible elongated conductor located in and extending along each of said second third and fourth recesses

remote from said second face; and

a flexible elongated conductive blade located in, and extending along each of said second, third, and fourth recesses, and being in electrical contact with said respective elongated conductor, each blade extending from its respective elongated conductor towards said second face of said housing, said flexible conductive track being held in said first chamber with said second face of said track facing said second opening of said rigid elongated housing;

d) a take off means comprising a projection, and tines extending radially from said projection and conductively connected to an external output from said take off means, whereby said tines are adapted to engage in a conductive manner with a respective blade means in a respective recess of said flexible conductive track, when said projection is inserted into said second opening of said rigid housing with said tine aligned substantially with said second opening, and said power take off device being then rotated to enter the first opening to engage the tines with said blade means;

wherein said recesses are adapted such that, when the strip is laterally bent around a corner, the walls of the recesses, at or near the point of bending, collapse so that the width of the recesses is substantially reduced and the strip is allowed to bend laterally.

10. A system according to claim 9 having a flexible conductive track according to any one of claims 3 to 8.

11. A system according to claims 9 or 10 wherein said second face of said flexible conductive track faces substantially downwardly.

12. A system according to any one of claims 9 to 11 wherein said conductor in the third recess is the earth.

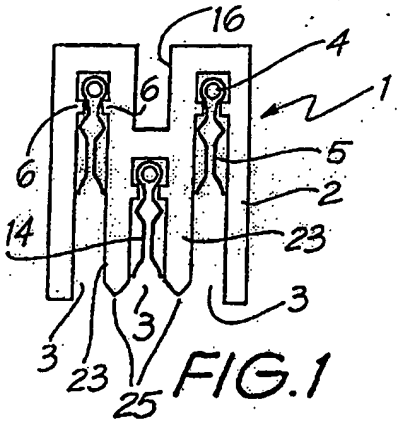


FIG.1

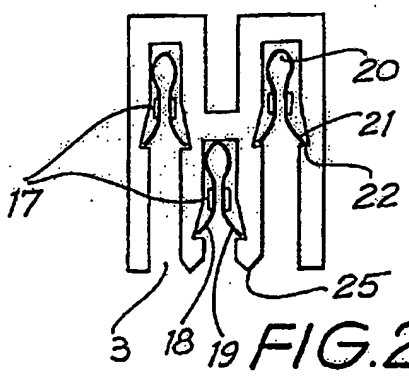


FIG.2

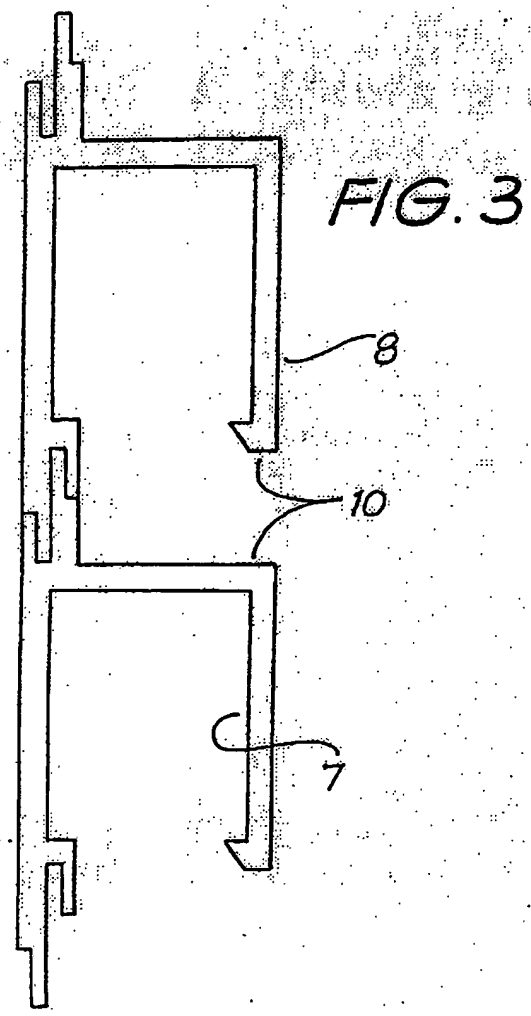


FIG.3

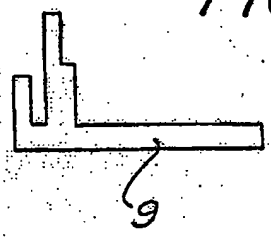


FIG.4

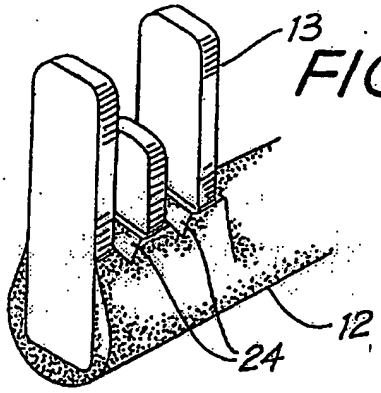


FIG. 5

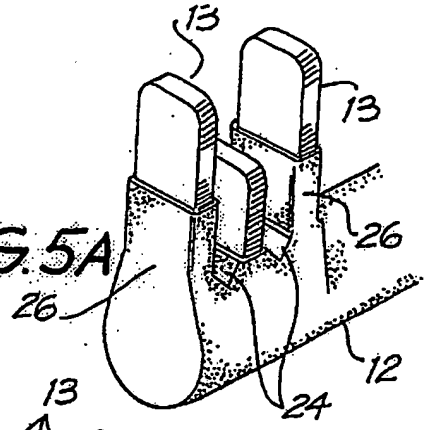


FIG. 5A

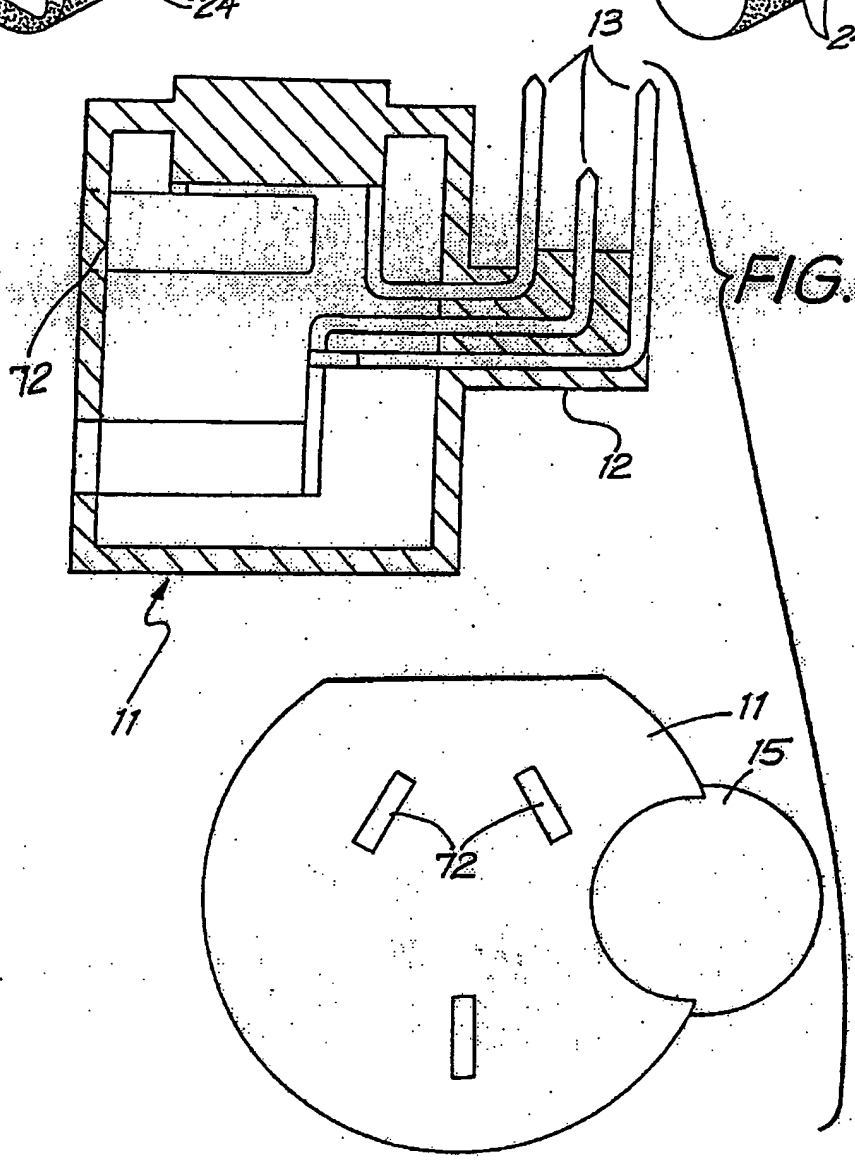
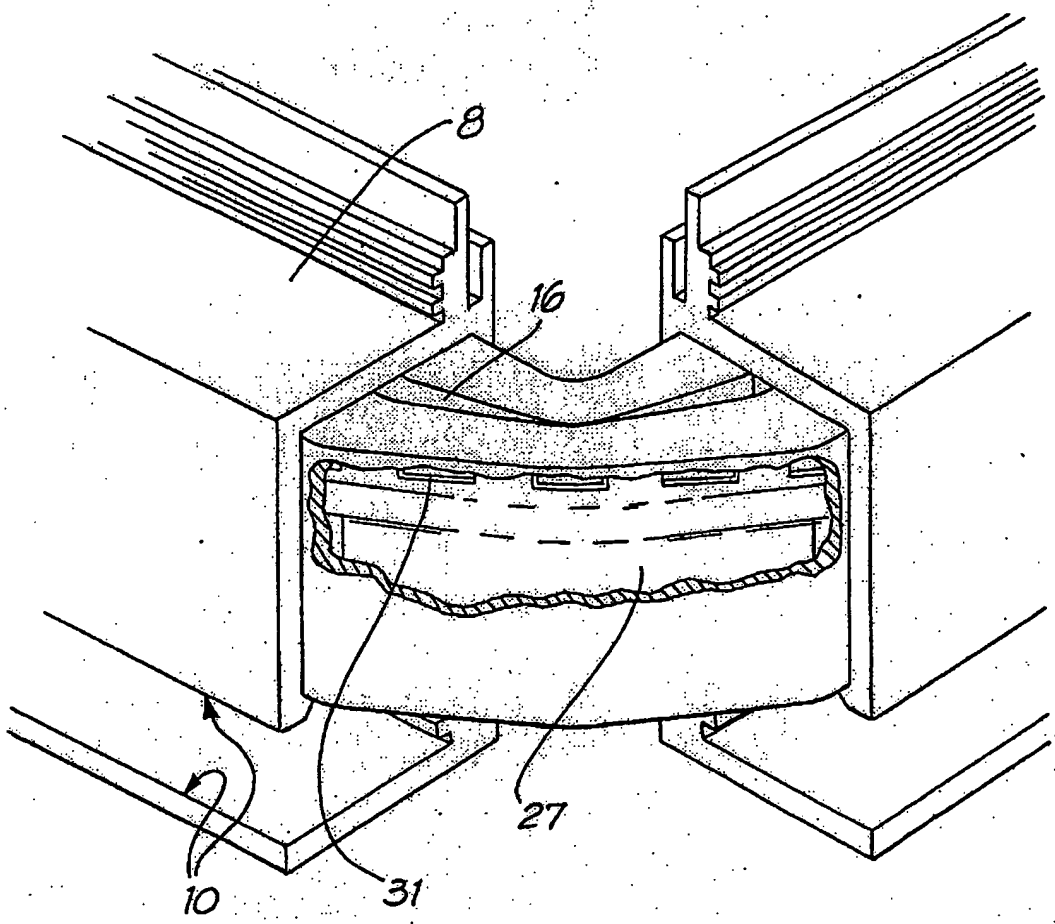


FIG. 6

FIG. 7



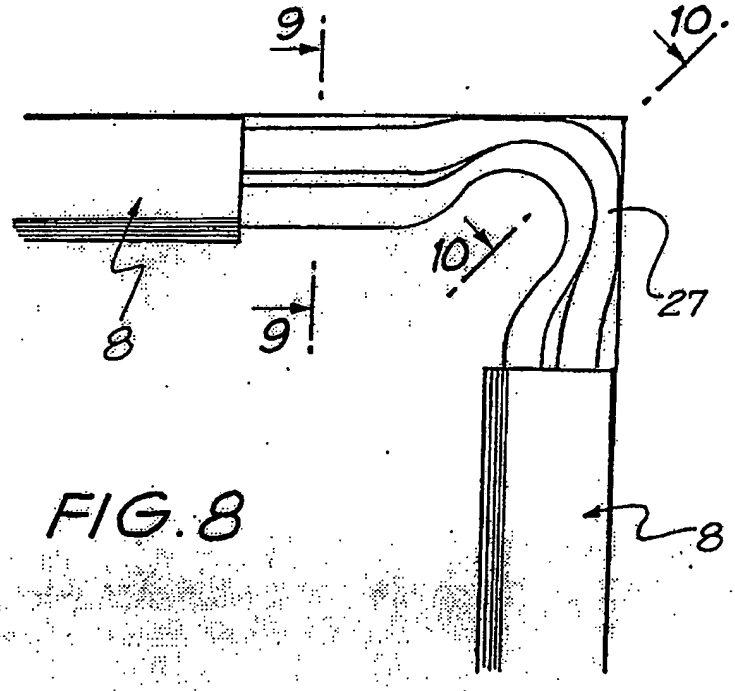


FIG.8

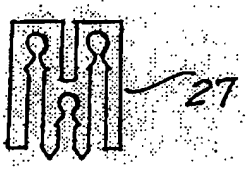


FIG.9

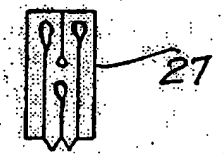


FIG.10

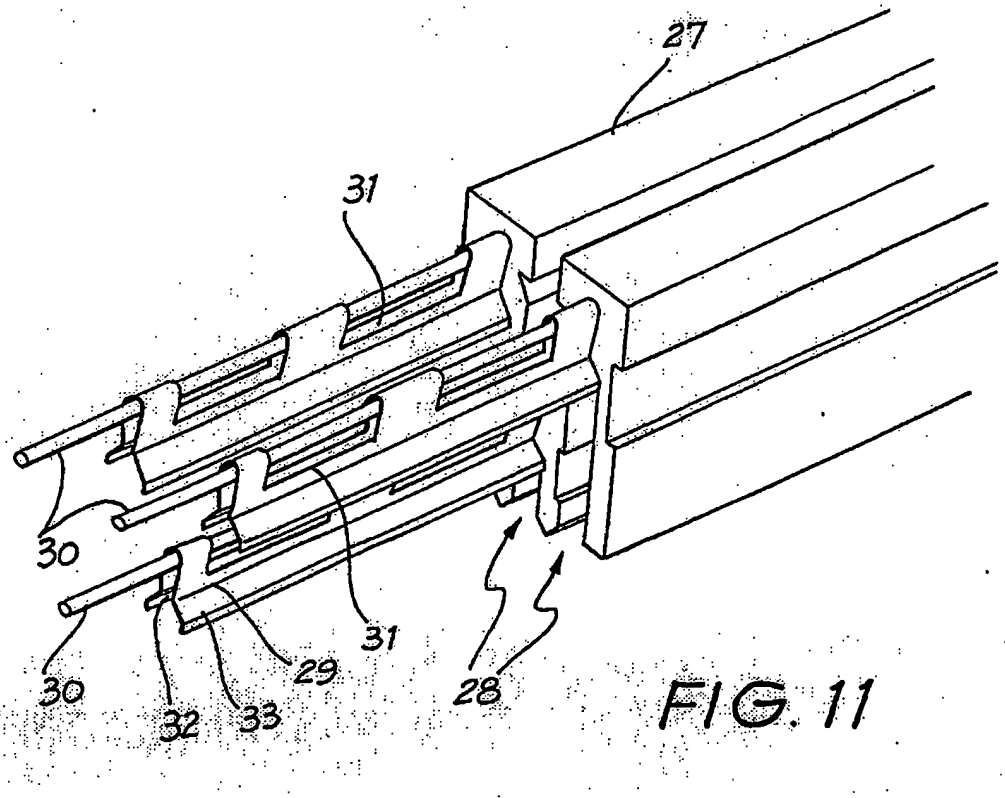
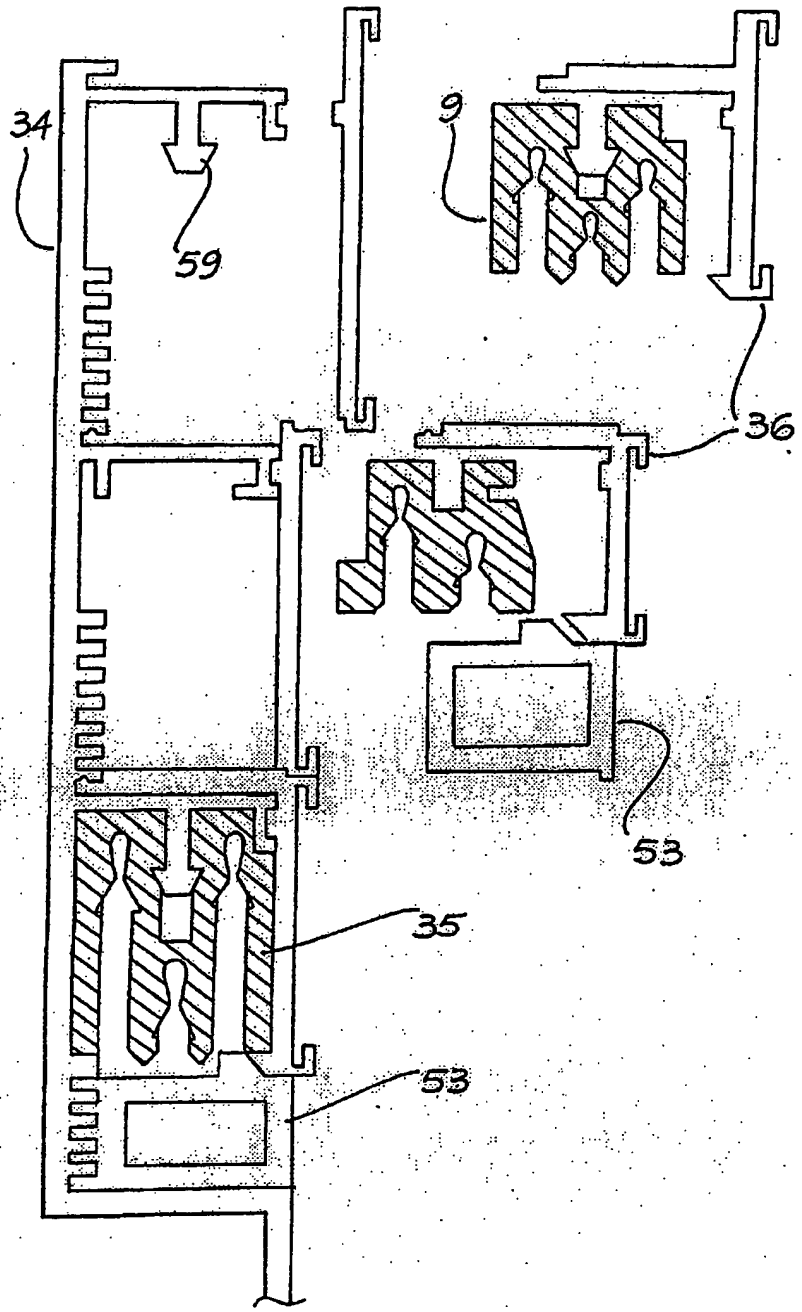


FIG. 11

FIG. 12



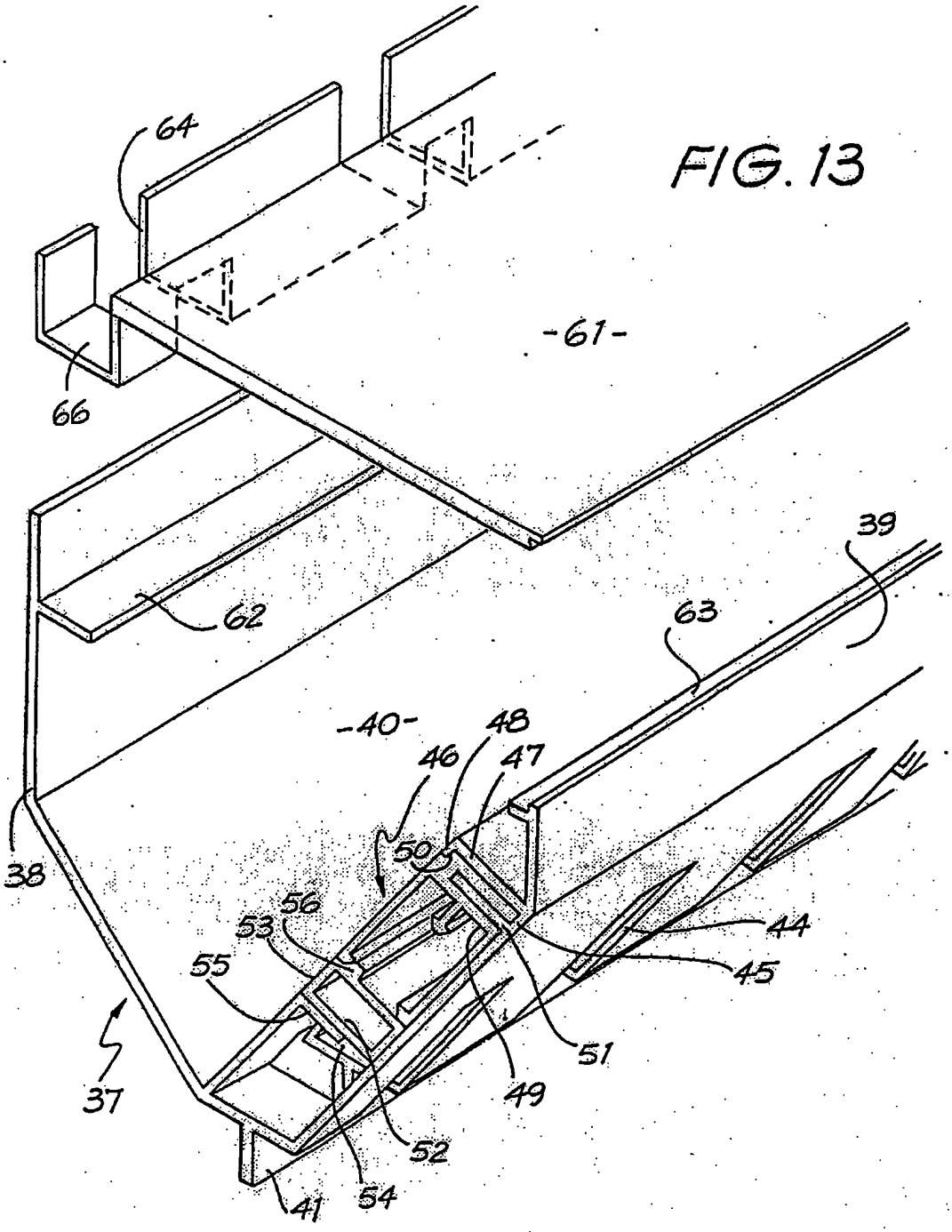


FIG. 13

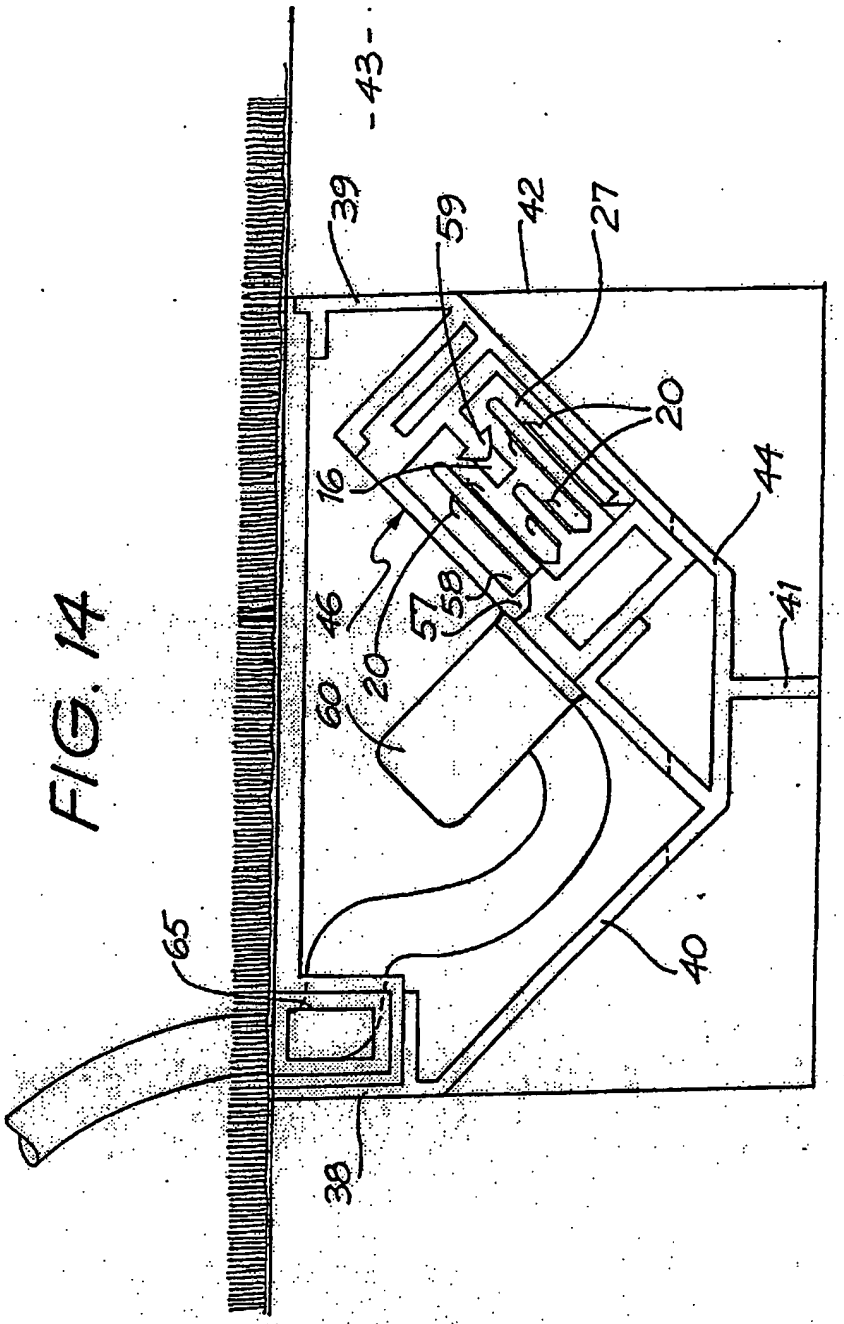
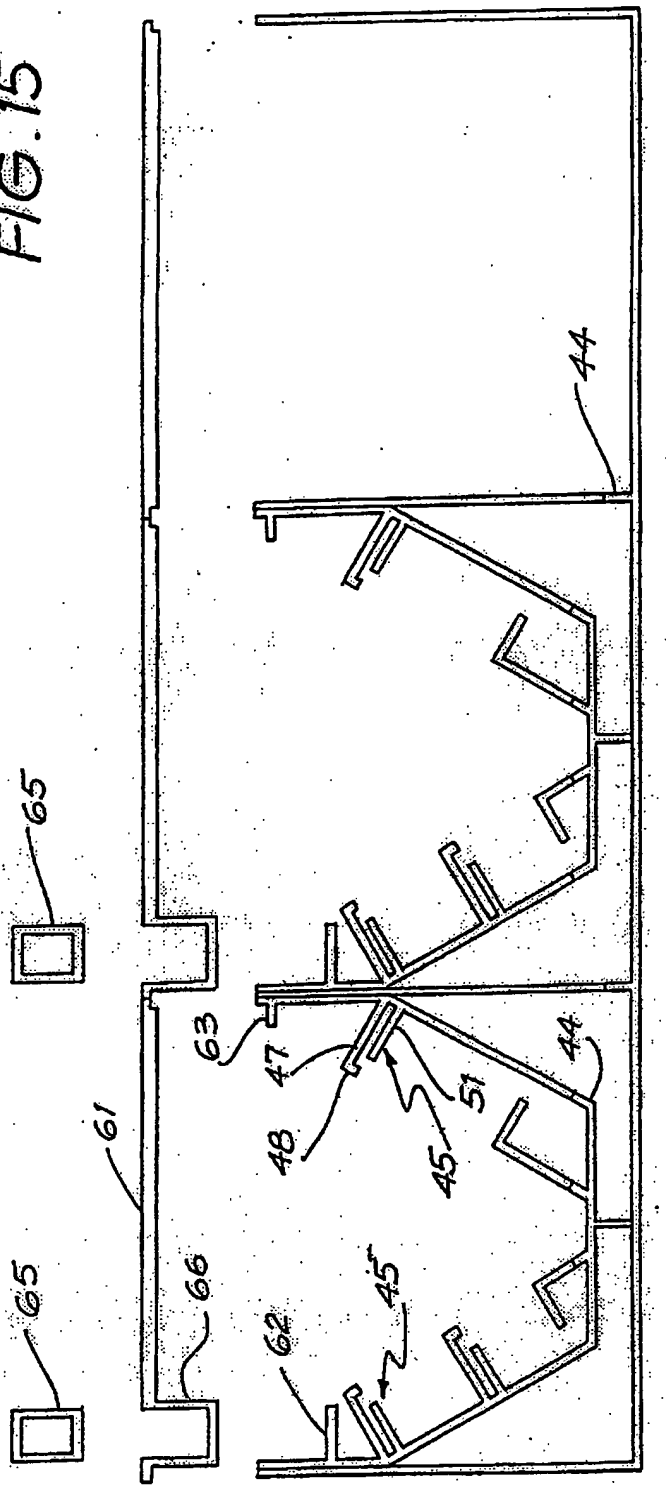


FIG. 14

FIG. 15



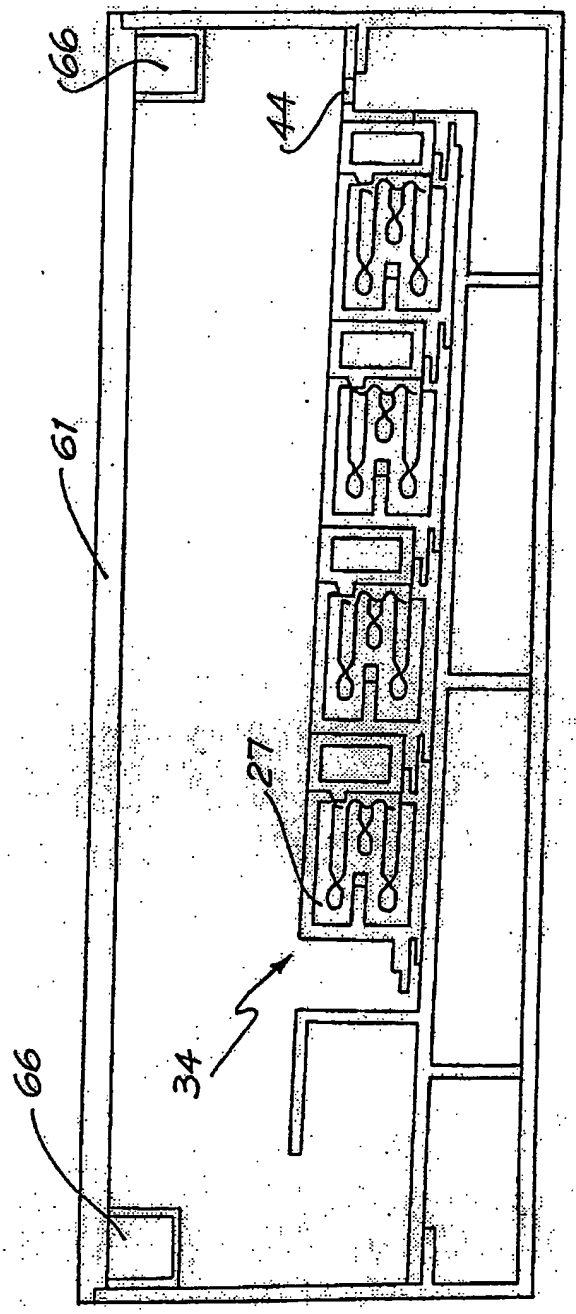


FIG. 16

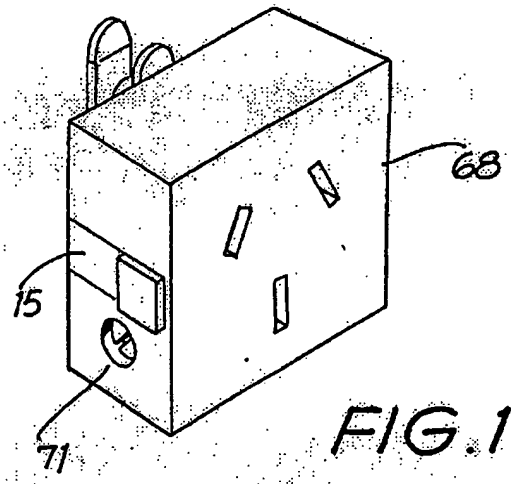


FIG.17

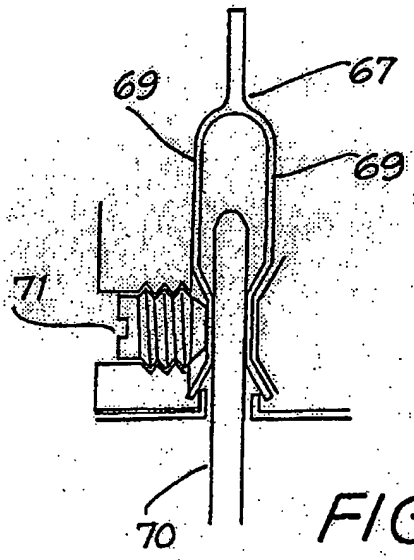


FIG.18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU92/00414

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl.[5] H01R 25/14, H02G 5/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC H01R 25/14, H02G 5/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC as above, IPC H02G 3/04

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
	AU,B, 76708/81 (548273) (ELECTRAK INTERNATIONAL LIMITED) 6 May 1982 (06.05.82)	
X	page 11 line 6 to line 21, figures 1,2	1-6,8
Y	page 11 line 21 to page 12 line 5, page 17 line 6 to page 18 line 3, page 18 line 24 to page 19 line 3, figures 1,4	9-12
	AU,B, 53240/73 (467012) (N.V. PHILLIPS et al) 19 September 1974 (19.09.74)	
X	page 4 lines 11 to 21, figure 1	1,5,6,8
	US,A, 2478006 (JAMES J. PADEN) 2 August 1949 (02.08.49)	
X	column 4 line 3 to line 24, figure 3	1,5,6
Y	column 3 line 12 to line 17	1,5,6

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 November 1992 (12.11.92)	19 NOV 1992 (19.11.92)
Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA	G.T. Powell
Facsimile No. 06 2853929	GREG POWELL Telephone No. (06) 2832308

Form PCT/ISA/210 (continuation of first sheet (2)) (July 1992) copjne

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X	US,A, 2243990 (PERCY M. THORN et al) 3 June 1941 (03.06.41) page 1, column 2, line 5 to line 16, figures 2,3,8-16	1,5,6
X	GB,A, 394199 (ALDO FRANCO PESSINA) 22 June 1933 (22.06.33) page 1, column 2 line 85 to page 2, column 1 line 7, figure 1	1,5,6
Y	US,A, 4289365 (HENDRIK J. RUTGERS) 15 Seaptember 1981 (15.09.81) page 2 line 32 to line 37, figure 1	1,5,6
Y	AU,A, 62866/86 (BARRIER SHELF CO PTY LTD) 12 March 1987 (12.03.87) Abstract, figures 3,6,7	9-12
Y	AU,A, 49114/90 (LEGRAND) 16 August 1990 (16.08.90) Abstract, figures 1,2,8	9-12

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
AU	62866/86	CN	86106055	DE	3690441	EP	235206
		GB	2189094	JP	63501180	WO	8701524
US	4289365	BE	879791	DE	2943503	FI	793404
		FR	2440635	GB	2039422	IT	1124892
		NL	7810941				
AU	76708/81	CA	1171479	DE	3174636	EP	51951
		GB	2087168	HK	522/85	JP	57103276
		MY	226/87	SG	306/85	US	4479687
AU	53240/73	BE	796924	CA	987752	CH	559978
		DE	2311614	ES	412737	FR	2176810
		GB	1390162	IN	138630	JP	49012396
		NL	7203660	SE	391420	US	4105099
		ZA	7301679				
AU	49114/90	BR	9000608	EP	382597	FR	2642911
		US	5089667	ZA	9000807		

END OF ANNEX